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ABSTRACT

Children's understanding and use of anaphora and cohesive ties in comprehending text were studied by using selected school texts that had a number of cohesive ties deleted. It was hypothesized that the replacement of the deleted ties would indicate that the text within the location of a specific tie had been successfully read and understood. Subjects were 27 six- and seven-year-old and 30 nine- and ten-year-old children. The older children showed a greater ability to supply the word preferred by the author. The same was true for responses that were not exact replacements but could be considered cohesive. There was also a marked drop in omissions by older children compared with the younger children. (RL)

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The Comprehension of Anaphora

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The Comprehension of Anaphora

During the past decade increasing interest has been shown in the anaphoric processes which are found in all types of text and its effects on children's comprehension of those texts. This research interest has taken various forms but the results of the investigations carried out have been equivocal. Furthermore, by present day standards they are seen to be restricted in scope and not in line with some of today's concerns for ecological validity. (Brofenbrenner, 1976).

Anaphora has been variously defined, but the version favoured here is that provided by Halliday and Hasan (1976) as a major element in their concept of cohesion. The identification of one element in a text is said to be related back to some other element in the text that has already been mentioned, that is the element has been presupposed. But notice here, that it is not enough for there to be presupposition, the presupposition must be satisfied for cohesion to exist and for understanding to take place.

This placing of anaphora within the cohesive structure of texts is important for the development of the understanding of anaphora as a few studies will illustrate.

One of the early studies, that of Bormuth et al (1970), looked at 14 anaphoric structures and showed that children obtained scores ranging from 64.5% to 86.5% correct when questioned about them. Lesgold (1974), again using 14

anaphoric structures, but not all the same as Bormuth et al, however, does not agree with their findings.

Richeck (1976-77) did not report a range of scores but commented that mastery was incomplete at 3rd grade.

Barnitz (1974) using the pronoun 'it' to probe understanding showed scores increasing over Grades 2,4 and 6. And Stevenson (1981) in her recent study used 4 anaphoric structures to compare performance where the antecedent was stated and when it was not stated. She used longer stretches of text than her predecessors and again showed a spread of scores, at 3rd Grade level of 51-80% and at 8th Grade 72-92% correct.

The main finding then has been that the ability to understand anaphoric relations in texts is subject to a development process which is still evolving as late as Grade 8. Furthermore, these findings imply that there are a considerable number of children who cannot comprehend the relationship fully.

As indicated already the notion of presupposition and the satisfying of that presupposition is necessary for understanding of the process: thus taken together the process becomes part of the cohesion of a text. An instance of such a process is termed a cohesive tie, and Halliday and Hasan (1976) propose that there are 5 main groups of these cohesive ties. Most of the studies mentioned have been concerned with the reference type of anaphora, with the personal pronoun being one of the most common forms investigated. Many of these studies have been limited

to pairs of sentences or short passages where it is difficult for the reader to build up an appreciation of texture.

If the cohesion of texts is important, and the anaphoric process is said to be one of the key relationships, then to only investigate sentence pairs or short passages will give a less than satisfactory picture of the actual dynamics of reading in naturally occurring texts of the classroom type. Anaphora and its understanding needs to be studied in longer stretches of texts with attention being paid to different types of text. The question to be put is, "How do children come to understand the working of the anaphoric process in texts which are placed before them for various curriculum purposes?

The proposals for cohesion provided by Halliday and Hasan (1976) contain, as mentioned above, the concept of the cohesive tie. That is, there are certain elements in a text, a word, a group of words the understanding or interpretation of which exists by its association to an element in the text. This notion provides a series of different types of text linkages which, when negotiated provides it is suggested, semantic integration. It is possible using these proposals to identify and analyse the cohesive ties across texts. This system has been used recently in a number of research studies into cohesive anaphora and this development gives the research a new perspective.

Mention may be made of four such studies. Firstly, Garber (1979) examined five year old children's oral production in six different language situations for evidence of cohesive

tie usage. She then compared this with cohesive ties in basal readers. She records that all five groups of cohesive tie were present in children's oral production. There was however, an absence of cohesive ties of certain types in the early reading material of those children. While the latter is of importance, what is of interest here is that the children were using the 5 groups of cohesive ties at five years of age. in their oral language.

The second study using the cohesive tie framework, albeit post hoc, was that of Rhodes (1979), who was interested in comparing the reading performance of 1st Grade children on 4 simple stories used for teaching reading. The 4 stories were chosen for their more and less predictable structures. Rhodes used story retelling as her method of examining reading performance. She found a significant and persistent relationship between the types of reading materials read and the reading behaviour exhibited by the children in the sample. She also found correlations between the results of her analyses by story structure and cohesion analysis. In general the more predictable stories had more cohesive ties but there was no direct relationship between reader performance and number of cohesive ties. "The more predictable story quarters were found to be characterized by moderate cohesive distance (2.2 to 4.1 intervening sentences) and by both mediated and non-mediated distance. In the less predictable stories, the cohesive distance of half the story quarters was not characterized by mediation."

The third study utilised cohesion analysis more directly and also analysed for text structure. Teddlie (1979) was interested in exploring 'the interaction between anaphoric processing and text characteristics which might influence that processing." The children in her study were 2nd and 4th graders and she used specially written stories embodying cohesion and structural characteristics. Her conclusions were that 'while it (cohesion theory) describes the nature and extent of text cohesion of specific discourse referents (it) does not describe factors influencing semantic recall for these referents in absence of other characteristics." She also found that references expressed anaphorically tend to be less well recalled than those expressed lexically. Her 4th graders recalled more anaphoric relations as well as more propositional information than 2nd graders. Fourth graders also tended to use aspects of discourse structure to better advantage than do 2nd graders. One other implication, which is important for this paper, was the suggestion that "characteristics of connected discourse do influence first stage inferencing and therefore contexts of full passages should be used to investigate the nature of the complex interactions occurring between discourse level processing and anaphoric resolution and recall."

The fourth study of this group is that of Moberley (1978) who investigated the ability of 4th and 6th graders to complete anaphoric references in a series of controlled situations. She sought a hierarchy of anaphoric form understanding and, unlike other studies, controlled for tie

location.

Mention has already been made of mediated ties in the Rhodes' study. In Moberley's study the three locations, immediate, mediated and remote were systematically investigated. Moberley wrote two stories so that 4 types of anaphoric form (lexical, substitution, reference, and ellipsis) whose presuppositions were placed in 3 locations (immediate, mediated and remote) were counter-balanced. The children were required to write down the presupposed item of the (underlined) anaphoric form.

Significant differences were found in grades, among anaphoric types and also among tie locations. There were also significant differences in the mean scores of the lexical and reference types and between reference and ellipsis. There were, furthermore, significant interaction effects between anaphoric forms X and tie location and between grade X anaphoric form X tie location.

Interestingly the same patterns of difficulty do not evolve for 4th and 6th graders. Tie location did not change understanding of substitution and lexical types for 4th graders to a significant extent. Following the expected downward trend in score from immediate to remote only lexical ties conformed to expectation. Substitution ties remained constant over mediated and remote distances, while reference reversed the pattern and although scores were very close the difficulty order was remote easiest, then mediated and finally immediate. Reference is one of the groups of ties with which 4th graders were comfortable no matter

the location of the presupposition. 6th graders performance was erratic across tie locations in all but substitution which followed the expected consistant gradual downward trend as tie location moved further away.

These studies, which looked at a range of anaphoric relationships in terms of cohesion have revealed a great deal of the complexity of the process. For the purpose of this paper, the important findings appear to be:

1. Children at five years of age use all five groups of cohesive ties in their oral language production.
2. Cohesive anaphoric forms and other types of text structure interact.
3. The location of the tie in terms of distance between the anaphor and antecedent is important but inconsistent in its effect across texts.
4. There is strong evidence of a developmental pattern in the ability to comprehend anaphoric relationships which is irregular across cohesive ties.
5. Full passages should be used to investigate the nature of the complex interaction occuring between discourse level processing and anaphoric resolution and recall.

Taking these findings into consideration the following strategies were adopted to investigate the comprehension of anaphora further.

1. It was decided to follow up the strong evidence of a developmental pattern and to seek for evidence of this in the reading performance of children aged 8, 11 and 13.

2. Due to interaction found between anaphoric forms and other text structure variables, a modified cloze procedure was employed to gather data. The rational for this was that in replacing the deletions, which were arranged to cut the ties, other text features would also be taken into account in deletion replacement. Furthermore, the procedure would enable the investigators to examine words, other than the author's preferred word, inserted. The procedure also directs the reader's attention into the text.

3. To use continuous texts of some length. Texts that reflect those that children meet for various curriculum settings in schools.

To achieve these purposes of the study a large number of textbooks and other reading materials were collected according to 3 criteria:

most frequently read by children. (own library choice)
most frequently read to children. (by teachers)
most frequently used for content reading.

From these a selection was made so as to balance the length of the extracts, some being longer, some shorter. The lengths ranged from a couple of paragraphs to 3 pages of continuous texts. All the extracts were controlled within bands of difficulty - one for junior, one for secondary children - decided by teacher judgment. There were 61 extracts arranged in 4 booklets, two booklets per age group, one fiction one non-fiction. Two extracts were overlapping or anchor passages.

Four groups of ties were taken from the Halliday and Hasan (1976) proposals. These were Reference, Substitution, Conjunction and Lexical Cohesion. (It is not possible to delete Ellipsis). These four groups were sub-divided so that Reference contained personal reference, demonstrative and comparative reference. Substitution includes nominal, verbal and clausal. Conjunction involves, additive, adversative, temporal and causal, and lexical cohesion reiteration and collocation.

The booklets contained texts with 65 deletion per booklet covering these groups and sub-groups of cohesive ties as well as 5 deletions in each booklet of words not considered cohesive. i.e. 260 deletive across 4 booklets. It was believed that this procedure would sample a large number of texts representing a fair range of the texts children have to read, and that the large number of cohesive ties, spread at random across the booklets, would provide a fair sampling of the 4 types of cohesive ties across different locations.

Two anchor passages were built into the booklets such that the same extract was included in both the younger and older children's booklets. This enables an analysis to be made of the performance of younger and older children on the same passage.

The results reported now are from one of a series of pilot tests and illustrate the analysis procedures. The data was collected from a class of (27) 6/7 year olds and a class of (30) 9/10 year olds. These children

were a year younger than those for whom the booklets were originally designed. This was done to ensure the materials were likely to elicit sufficient deletion replacements later from children a year older in the main sample.

Results

Ten deletions common to the booklets prepared for both age groups were examined. Of these, two were pronouns, three were substitutions, three were conjunctions and two were items believed to be lexically cohesive. The percentage scores by age group obtained by the children in terms of the replacement of the word preferred by the author (i.e. exact replacement) are recorded in Table 1.

Table 1 about here

There was a marked increase in the percentage scores in favour of the older children.

The responses were next analysed so as to allow consideration of words other than exact replacement of the author's preferred word. For the purpose the responses were categorised according to whether they gave evidence of cohesion having been perceived by the reader. Responses showing this awareness were:

a) a word from the same sub-group as the deleted word.

b) a word from the same main group as the deleted word.

c) another cohesive word

d) the related presupposing word

Responses considered as not having this cohesive characteristic were:

e) a word that was unacceptable as cohesive in that position in the text

f) an omission

Percentages were calculated for each category so that the performance of the children can be compared. These are shown in Figure 1 where they are arranged in terms of 1. exact replacement of the author's preferred word, 2. cohesive word, 3. non-cohesive word and 4. omissions.

When the scores of the younger group are compared with that of the older group, there was an increase in favour of the older group of children who replaced the exact word in each group of cohesive ties more frequently. The same was true for responses that were not exact replacements but could, nonetheless, be

Figure 1 about here

considered cohesive. On the other hand, the responses deemed to be con-cohesive were not as consistent. In the main the percentage scores increased with age but not in all groups of ties (e.g. pronouns).

If it were not considered unreasonable, and so as to present an overall summary, the results can be collapsed by combining the exact replacement with the cohesive scores on the one hand and the non-cohesive scores with the number of omissions on the other.

These are shown in column 6, Figure 1.

Discussions

That there is an increase in the percentage scores by the older age group compared with the younger came as no surprise but within this overall picture some interesting features can be observed.

Firstly, there is the marked drop in omissions in the results of the older children compared with the younger. While every encouragement was given to the children to make a response, the younger ones, although in no way distressed, found the task very demanding.

When the percentage of omissions is compared with the percentage of non-cohesive responses however, a further point can be made. In some cases, e.g. lexical cohesion and substitution, the older children make more non-cohesive responses, and this goes against the overall trend of increasing improvement by that group as is shown in column 5, Figure 1. This might be explained by the older children's growing confidence in making a response or that they were more ready to respond to the instruction to 'fill in the gaps if at all possible'. This they may have done sometimes at the expense of an exact or meaningful response. To combine the non-cohesive responses with the omissions as in column 6, may therefore, give a more accurate picture.

A second point worthy of mention is that the words deemed cohesive are consistently supplied by children in each age group although those words are not exact replacements. This points to a growing awareness of the need at that particular point in the text for a word that has cohesive potential. That children would be able to do this fits in with the study made by Garber (1979) who found that young children were able to use all five groups of cohesive tie in their oral production. They have then the necessary knowledge of the ways, or rules by which one element of the language can be related to another but have yet to develop the ability to use words with precision in cohesive situations. These results are in line with other investigations that have been made. (see Chapman 1979a,b,c, 1981, Chapman and Stokes, 1980).

The notion of the cohesive tie is based mainly on the way in which anaphoric relationships work in texts. In reading terms, rather than linguistic, it is suggested that the reader has to process the clauses or sentences within the location of the tie so as to gain the information necessary to replace the deletion. The replacement of the deletion could be seen therefore, as a measure of the successful processing of the structure of the sentence together with the inter-sentence linkages. In this way replacing deleted cohesive ties can be said to reflect the successful comprehension of anaphora.

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Table 1

Percentage of children from two classes (6/7 years 9/10 years) replacing author's preferred word according to four groups of cohesive ties.

	6/7 years (n=32)	9/10 years (n=27)
Pronouns	10.9%	25.9%
Substitutions	6.3%	16.1%
Conjunctions	3.1%	17.3%
Lexically cohesive items	0.0%	3.7%

(Two pronouns, 3 substitutions, 3 conjunctions and 2 lexically cohesive items were deleted.)

Figure 2 Histograms comparing the percentage scores of 6/7 year old and 9/10 year old children when replacing cohesive tie deletions.